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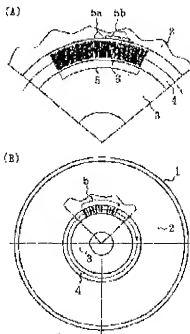
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(54) OPTICAL DISK AND ITS REPRODUCING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To effectively prevent illegal copies of optical disks recorded with music software and game software, etc.

SOLUTION: A bar code symbol 5 consisting of bar elements 5a formed as through holes in a radial pattern is constituted in a specular surface area 4 in the innermost circumference of the optical disk 1, and this bar code symbol 5 is given identification information of the optical disk 1, while the surface of individual reflecting layers between individual adjacent bar elements 5a are formed with a large number of long and narrow grooves 6 in the radial direction as seen from the center of the disk 1. A signal obtained from the bar code symbol 5 and a modulation signal by the narrow grooves 6 are individually detected by the reproducing device, and the former signal is decoded, and the latter signal is detected and then decoded to obtain their bar code data respectively. Then, by confirming one data to be reasonable and coincidence of both data, reproducing permission of main information of the disk 1 is given as the legal disk 1.



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CLAIMS

[Claim(s)]

[Claim 1] In an optical disk, it is except the record section of the main information. By the optical pickup to the reflecting layer of the field in which read is possible While the bar code symbol which consists of a bar element which looked at from the core of a disk and was formed in the radiation direction as a long through tube is constituted and the aforementioned bar code symbol has the information for identifying the optical disk The optical disk characterized by having seen on the front face of each reflecting layer between the bar element which adjoined from the core of a disk, and forming the rill of a long a large number book in it in the radiation direction.

[Claim 2] The read control means which it is the regenerative apparatus of the optical disk of claim 1, and moves an optical pickup to the configuration field of a bar code symbol, and performs read of a signal in advance of playback of the main information on an optical disk while rotating an optical disk, A 1st filter means to pass only the signal component obtained from the bar code symbol from the signal which the optical pickup read in the control process by said read control means, A 2nd filter means to pass only the signal component obtained from the signal which the optical pickup read based on the rill currently formed between the bar elements which the bar code symbol adjoined in the control process by said read control means, A detection means to detect the output signal of said 2nd filter means, and a 1st data origination means to create bar code data based on the output signal of said 1st filter means, A 2nd data origination means to create bar code data based on the detection output signal of said detection means, The switching means to which each bar code data based on each aforementioned data origination means is made to output alternatively, A storage means to memorize each bar code data by the change of said switching means, A distinction means to distinguish whether it is discernment data with which one which said storage means memorized of bar code data is given to the optical disk of normal, A comparison means to compare both bar code data that said storage means memorized, The regenerative apparatus of the optical disk characterized by providing a judgment means to give playback authorization of the main information on an optical disk only when it distinguishes that it is discernment data with which said distinction means is given to the optical disk of normal and said comparison means checks coincidence.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] The optical disk which was applied to an optical disk and its regenerative apparatus, especially recorded a music title, game software, etc. checks strictly whether it is the product of normal, and this invention relates to the cure for preventing the unjust duplicate from which infringement of copyright is constituted.

[0002]

[Description of the Prior Art] Since the information is recorded with the digital data, also by many duplicates, DVD (Digital Video Disc) which are the optical disk used for CD (Compact Disc) which is an audio disk, or the record medium of a TV game, and the image disk which attracts attention further recently does not have degradation of tone quality or an image, and a duplicate more unjust than record media, such as a music magnetic tape of analog recording, tends to overrun it. When reproduced as an optical disk with which those optical disks are especially called a "pirate edition", great disadvantageous profit will be brought to a copyright person and a publishing company.

[0003] Therefore, while consideration also with the special Copyright Act is achieved, in the publishing company side, printing and stamping the identification information (a manufacture lot number, serial number, etc.) which shows that it is the product of normal to the mirror plane field by the side of the labelled surface and the most inner circumference of an optical disk, and managing manufacture and shipment is performed. . However, in printing and a stamp performing the aforementioned identification information, since the duplicate is also easy, the method which the front stirrup which forms the protective layer on the occasion of manufacture of an optical disk forms the through tube which sees from the core of a disk to the reflecting layer of a mirror plane field by the high power laser beam, and serves as a long bar code element in the radiation direction after forming, and constitutes a bar code symbol is proposed (JP,6-203412,A). Moreover, while recording the main information with the fixed coding means, the applicant for this patent The key information which shows the decryption means of the main information is recorded on the aforementioned mirror plane field etc, by the bar code symbol. The method (JP,7-85574,A) which decrypts and reproduces the main information by the decryption method in which a regenerative apparatus reads the key information and is shown using the information, Key information was given in the deformation mode of the pit which constitutes the main information, and the playback system (JP,8-124219,A) of reading the key information previously and choosing a decryption means etc, is proposed.

[0004] In addition, although there is also a cure only by the logical technique in which the above physical means are not involved among the cures which prevent the duplicate of a software product, generally the physical means are more more effective.

[0005]

[Problem(s) to be Solved by the Invention] By the way, although a duplicate becomes difficult rather than a method with printing to the conventional labelled surface, or the stamp to a mirror plane field when based on the method of JP,6-203412,A, a comparatively easy facility can perform easily forming the bar code symbol of a proper with a bar code element with wide width of face using a high power laser beam, and the processing cost is also cheap. It follows, so a duplicate is easy and it is a question which has the effective prevention effectiveness to the duplicate of an optical disk by the practical aspect.

[0006] On the other hand, by the method of JP,7-85574,A and JP,8-124219,A, in order to relate the decryption approach by the side of a regenerative apparatus and to make reproductive authorization/disapproval determine, it becomes effective duplicate preventive measures. However, as well as the case of aforementioned JP,6-203412,A since formation of a bar code symbol is comparatively easy, the effectiveness will be lost by JP,7-85574,A. Moreover, although a very high security function is realizable in JP,8-124219,A since a special method called deformation of a pit is adopted, it is unavoidable that need the complicated and advanced technique for modulating a very detailed pit, an expensive manufacturing facility is needed, and the yield falls after the manufacture phase of a disk or manufacture. Comparatively cheap slot formation equipment can perform forming a shallow slot precisely to a mirror plane field after the manufacture phase of a disk, or manufacture to it.

[0007] Then, whether it is the product of normal could judge by the bar code, and the duplicate offered the difficult optical disk with a comparatively cheap facility, and this invention was created for the purpose of preventing a conjointly unjust duplicate effectively with the configuration by the side of a regenerative apparatus.

[0008]

[Means for Solving the Problem] The optical disk of this invention is except the record section of the main information. By the optical pickup to the reflecting layer of the field in which read is possible While the bar code symbol which consists of a bar element which looked at from the core of a disk and was formed in the radiation direction as a long through tube is constituted and the aforementioned bar code symbol has the information for identifying the optical disk The optical disk characterized by having seen on the front face of each reflecting layer between the bar element which adjoined from the core of a disk, and forming the rill of a long a large number book in it in the radiation direction is started.

[0009] And the read control means which moves an optical pickup to the configuration field of a bar code symbol, and performs read of a signal while rotating an optical disk in advance of playback of the main information on an optical disk on the occasion of playback of the optical disk, A 1st filter means to pass only the signal component obtained from the bar code symbol from the signal which the optical pickup read in the control process by said read control means, A 2nd filter means to pass only the signal component obtained from the signal which the optical pickup read based on the rill currently formed between the bar elements which the bar code symbol adjoined in the control process by said read control means, A detection means to detect the output signal of said 2nd filter means, and a 1st data origination means to create bar code data based on the output signal of said 1st filter means, A 2nd data origination means to create bar code data based on the detection output signal of said detection means, The switching means to which each bar code data based on each aforementioned data origination means is made to output alternatively, A storage means to memorize each bar code data by the change of said switching means, A distinction means to distinguish whether it is discernment data with which one which said storage means memorized of bar code data is given to the optical disk of normal, A comparison means to compare both bar code data that said storage means memorized, Only when it distinguishes that it is discernment data with which said distinction means is given to the optical disk of normal and said comparison means checks coincidence, the regenerative apparatus possessing a judgment means to give playback authorization of the main information on an optical disk is applied.

[0010] In addition to the bar code symbol which is except the record section of the main information and formed the bar element by the through tube to the reflecting layer of the field in which read is possible by the optical pickup, in the optical disk of this invention, many rills of a book are formed between each bar element equivalent to that tooth-space element. And it can constitute so that existence of those rills cannot be recognized only by making between each bar element uniform somewhat dark visually in the mode for which it is camouflaged by the bar element.

[0011] by the way, it is alike, and although the bar code symbol has the contents which give the identification information of the optical disk, a rill does not give information with the special array of itself. However, when a bar code symbol and a rill are read by the optical pickup of said regenerative apparatus, the signal after detecting the output signal of the 1st filter means and the output signal of the 2nd filter signal with a detection means serves as almost same signal wave

form. Therefore, in the output signal of the 1st filter means, and the detection signal by the detection means, if bar code data are created with the 1st and 2nd data origination means, respectively, they will serve as congruous data. If it puts in another way, existence of a rill can be checked because each bar code data becomes the same, and since the identity cannot be secured when the rill is not given, it can check that it is not the optical disk of normal. A storage means is made to memorize each bar code data through a switching means in this invention. First, it distinguishes whether it is discernment data by which one of bar code data may be given to the optical disk of normal with a distinction means. Furthermore, when it sees whether each bar code data is the same with a comparison means, it checks whether the rill is formed in the optical disk and the conditions of these duplexes are fulfilled, it will judge that an optical disk is the product of normal, and playback authorization of the main information will be given.

[0012]

[Embodiment of the Invention] Hereafter, the optical disk of this invention and the operation gestalt of the regenerative apparatus are explained to a detail using a drawing. First, drawing 1 shows the top view (B) and the enlarged drawing of an important section by the side of the read side of the optical disk concerning an operation gestalt (A). In this drawing, 1 is an optical disk and the annular mirror plane field 4 is constituted by the field which is equivalent to the outside of the clamper field 3 by the inside of the lead-in groove section of the record section 2 of the main information. Here, the main information is not recorded on the reflecting layer (metal layers, such as aluminum) infixed between the transparent plastic layer (carbonate layer) in an optical disk 1, and the protective layer here, but the mirror plane field 4 is constituted as a mirror plane-like reflector.

[0013] And into the part which constitutes the bar code symbol 5 which took comparatively large module width of face by bar element which looked at from core of optical disk 1 to reflecting layer of mirror plane field 4 with this operation gestalt, and was formed in radiation direction as long through tube 5a, and is further equivalent to between each bar element 5a (i.e., tooth-space element 5b), it sees from the core of an optical disk 1, and actual formation of many long rills 6 has been carried out in the minute pitch in the radiation direction. Moreover, the aforementioned bar code symbol 5 is constituted so that the identification information containing the serial number concerning the optical disk or a lot number may be given. In addition, a rill 6 is a slot shallowly formed in the front face of the reflecting layer instead of a through tube, and the width of face is far set up small as compared with the width of face of bar element 5a.

[0014] Therefore, although bar element 5a of a bar code symbol 5 can check the existence visually, a majority of the tooth-space element 5b is visible only as a somewhat dark field based on the optical diffraction phenomenon by the rill 6 of a book, and if it does not see under a microscope etc., it cannot check existence of a rill 6. Moreover, since it is camouflaged for a rill 6 by bar element 5a, it is difficult the rill to discover existence of a rill 6 visually.

[0015] If it sees in the hoop direction cross section passing through the abbreviation core of the width of face applied to radial [of the mirror plane field 4] in the part which gave the aforementioned bar code symbol 5, it has become like drawing 2. In this drawing, although 10 is a carbonate layer, 11 is a protective layer and the reflecting layer 12 is infixed among those layers, since bar element 5a which it was continuing and was shown by BE is formed as a through tube, the reflecting layer 12 is discontinuity in the part of tooth-space element 5b shown by SE. And the rill 6 is formed in the front face of the part corresponding to tooth-space element 5b of a reflecting layer 12 the small period.

[0016] The front stirrup from which each bar element 5a gives a protective layer 11 here in the manufacture process of this optical disk 1 based on the method of above-mentioned JP,6-203412,A is constituted by making a reflecting layer 12 condense a high power laser beam, and forming a through tube in that aluminum layer, before stiffening the given protective layer 11. On the other hand, a rill 6 is constituted by making a reflecting layer 12 condense the Koide force laser beam, and forming the irregularity of a small period in the front face of an aluminum layer. In addition, although formation of a rill 6 needs a comparatively advanced technique, a cheap facility can perform it. Therefore, when the mirror plane field 4 of an optical disk 1 is read and it scans to a hoop direction by the beam spot of light, at bar element 5a, light does not reflect but the reflected light modulated by the rill 6 arises in tooth-space element 5b.

[0017] And the aforementioned optical disk 1 is played with the regenerative apparatus shown in

drawing 3. However, the system circuit of drawing 3 is mainly a system circuit of the part relevant to the disk check in a regenerative apparatus, and the other part is omitted. The servo circuit where an optical pickup and 22 perform a spindle motor and, as for 23, 21 performs spindle tracking control etc. in this drawing, An actuator driver [as opposed to an optical pickup 21 in 24], the quantity of light detection amplifier with which 25 amplifies the detecting signal of an optical pickup 21, The low pass filter which passes only the photodetection signal component in which 26 appears with amplifier and 27 appears with the big amplitude and a big period by bar element 5a of a bar code symbol 5, and tooth-space element 5b (LPF), The comparator which 28 sets threshold voltage to Vtb and makes the output signal of LPF27 binary, The band pass filter which passes only the photodetection signal component which 29 is modulated with amplifier, and 30 is modulated by the rill 6, and appears with the small amplitude and a small period (BPF), The detector circuit where 31 detects the output signal of BPF30, the comparator which 32 sets threshold voltage to Vtl and makes the output signal of a detector circuit 31 binary, The switching circuit to which the output of each comparators 28 and 32 is inputted into, and 33 makes the input output alternatively by control, The bar code decoder to which 34 decodes the output data of a switching circuit 33, 35 is a microcomputer circuit (henceforth a "microcomputer circuit") which judges authorization/disapproval of playback of the optical disk 1 set in disk check mode while controlling the whole system of a regenerative apparatus in generalization.

[0018] Next, the operations sequence at the time of playing an optical disk 1 in the aforementioned system circuit is explained using the flow chart of drawing 11. Moreover, drawing 10 is referred to from drawing 1 if needed in process of the explanation. In drawing 3, if playback directions of an optical disk 1 are made to the microcomputer circuit 35, the CPU will perform the following procedures based on the control program stored in ROM. First, while setting up disk check mode and connecting a switching circuit 33 to the a side with playback directions, the control data in this mode is immediately outputted to the servo circuit 23 (S1 - S4). And the servo circuit 23 sets an optical pickup 21 to an abbreviation center position radial [in the annular mirror plane field 4], starts a spindle motor 22, and carries out 360-degree or more constant-speed rotation of the optical disk 1 (S5).

[0019] In the state of the rotation, although an optical pickup 21 will surely scan bar code symbol 5a, the signal wave form of the output signal at the time of crossing a bar code symbol 5 (read signal) turns into a signal wave form like drawing 4. Namely, since it is formed as a through tube in the time zone which crosses bar element 5a of a bar code symbol 5 so that clearly if drawing 2 is made to correspond, the amount of reflected lights falls extremely. Although the big amount of reflected lights is obtained since there is a reflecting layer 12 in the time zone which crosses tooth-space element 5b. A modulation arises in the amount of reflected lights by the rill 6 currently formed in the front face of the reflecting layer 12. Consequently, the output signal of an optical pickup 21 becomes the wave which the signal component which is modulated by bar element 5a of a bar code symbol 5 and tooth-space element 5b by the rill 6 of the signal component which appears with the big amplitude and a big period, and a tooth-space element 5b part, and appears with the small amplitude and a small period by them superimposed.

[0020] And the aforementioned read signal is inputted into LPF27 through amplifier 26 from the quantity of light detection amplifier 25, and is inputted into BPF30 through amplifier 29 from the quantity of light detection amplifier 25. Since LPF27 passes only the signal component by bar element 5a and tooth-space element 5b, it cuts the signal component modulated by the rill 6 of a tooth-space element 5b part, and makes the signal shown in the signal wave form of drawing 5 output here. Moreover, since BPF30 passes only the signal component conversely modulated by the rill 6 of a tooth-space element 5b part, it cuts the signal component by bar element 5a and tooth-space element 5b, and makes the signal shown in the signal wave form of drawing 7 output. More, LPF27 and BPF30 have frequency characteristics as shown by the dotted line of drawing 10 in the detail, and contain in it the spectrum of the signal component by bar element 5a and tooth-space element 5b, and the spectrum of the signal component modulated by the rill 6 in each passband.

[0021] Next, the output signal of LPF27 is inputted into a comparator 28, and after the output signal of BPF30 is detected in a detector circuit 31, it is inputted into a comparator 32. A comparator 28 serves as a signal of pulse shape as the output signal of a comparator 28 shown at

drawing 6 here, in order [of the P-P value of the signal wave form shown at drawing 5] to set up threshold voltage V_{tb} in the middle mostly and to make the output signal of LPF27 binary. On the other hand, the output signal of BPF30 inputted into the detector circuit 31 shows a high electrical potential difference only in the signal part modulated by the rill 6 since the dc component was removed by detection, the other part serves as a low electrical potential difference, and the output of a detector circuit 31 serves as a signal wave form approximated to the output signal (drawing 5) of LPF27 as shown in drawing 8 . And if this signal is made binary with the comparator 32 of the P-P value of the detection signal which set up threshold voltage V_{t1} in the middle mostly, it will become the signal of pulse shape as shown in drawing 9 . Therefore, the pulse signal of drawing 6 is inputted into the a side of a switching circuit 33, and the pulse signal of drawing 9 is inputted into the b side.

[0022] Here, it returns to the flow chart of drawing 11 , if one revolution of optical disks 1 is carried out where a switching circuit 33 is connected to the a side (S3-S5), the pulse signal of drawing 6 will be inputted into the bar code decoder 34, but since the pulse signal corresponds to a bar code symbol 5, the bar code decoder 34 outputs the decoding data (bar code data) Db which decoded it to the microcomputer circuit 35 (S6). Moreover, the microcomputer circuit 35 incorporates the decoding data Db from an I/O Port, and stores it in Built-in RAM (S6).

[0023] Next, CPU of the microcomputer circuit 35 outputs a change control signal to a switching circuit 33 through an I/O Port, and switches the connection condition to the b side from the a side (S7). And the pulse signal of drawing 9 inputted into the b side of a switching circuit 33 in 2 rotation eye of an optical disk 1 is made to input into the bar code decoder 34, and the bar code decoder 34 outputs the decoding data (bar code data) Dm which decoded it to the microcomputer circuit 35 (S8). Moreover, the microcomputer circuit 35 incorporates the decoding data Dm from an I/O Port like the above, and stores it in Built-in RAM (S8).

[0024] It means that the decoding data Db based on the bar code symbol 5 of an optical disk 1 and the decoding data Dm based on a rill 6 were stored in RAM of the microcomputer circuit 35 by the above procedure. Then, the microcomputer circuit 35 compares the decoding data Db with the data for distinction made to have stored in ROM beforehand first (S9). This data for distinction is data in which the range of the identification information which may be given to the bar code symbol 5 of an optical disk 1 is shown, and if the identification information given to the set optical disk is contained in that range, it can be once distinguished as that optical disk is the product of normal.

[0025] Therefore, in the aforementioned comparison result, with this operation gestalt, if the decoding data Db are contained within the limits of the data for distinction, an optical disk 1 can be regarded as what is necessary being just to make it decide that it is the product of normal, but CPU compares the decoding data Db with the decoding data Dm further, and only when that comparison result is in agreement, it judges that an optical disk 1 is the product of normal definitely (S9, S10).

[0026] Thus, imposing the check conditions of a duplex and judging the normality of an optical disk 1 has the following meaning. or [first, / that such a bar code symbol 5 is not attached by not checking whether the identification information by which the check conditions of S9 may be correctly given to this optical disk 1 by the bar code symbol 5 is expressed] -- or when the permissible serial number etc. is not expressed correctly, it will be said that it is the optical disk reproduced unjustly. However, since it can perform easily forming the bar code symbol 5 which consists of low consistencies comparatively by the cheap manufacturing facility, if the bar code symbol 5 of the optical disk of the normal made applicable to a duplicate is formed as it is even if it is the optical disk reproduced unjustly, the check conditions of S9 can be cleared, and the effectiveness for eliminating an inaccurate replica is lost.

[0027] By the way, if the rill 6 of an a large number book is formed in tooth-space element 5b in the bar code symbol 5 of an optical disk 1 as mentioned above, the pulse signal obtained from bar code symbol 5 the very thing of drawing 6 and the pulse signal obtained based on the rill 6 of drawing 9 must be in agreement. In the output signal of BPF30 of drawing 7 , it is because the direct-current part in which the signal has not appeared supported bar element 5b of a bar code symbol 5, and transformed it into the signal wave form of drawing 8 in the detector circuit 31, it was made binary with the comparator 32 and the pulse signal of drawing 9 has been obtained. Conversely, if it sees and many rills 6 of a book are not formed in tooth-space element 5b of a bar

code symbol 5 The modulated wave form by the rill 6 does not appear in the output of an optical pickup 21, but the output signal of BPF30 of drawing 7 becomes only a dc component. The output of the detector circuit 31 of drawing 8 is set to 0, a pulse signal will not appear [L level] continuously and the decoding data Db and Dm of the output of the comparator 32 of drawing 9 will not correspond as a result.

[0028] Therefore, in order to clear the check conditions of S10, the rill 6 of the a large number book for which it was camouflaged by bar element 5a of a bar code symbol 5 must be found out, actual formation of many rills 6 which need reconstruction and the advanced technique of a facility must be carried out, and most inaccurate replicas can clear this condition. That is, the security to an unjust duplicate can be raised by leaps and bounds on the check conditions of a duplex.

[0029] So, when the aforementioned S9 and both the conditions of S10 are cleared, the optical disk 1 with which the microcomputer circuit 35 was set judges with it being the product of normal definitely, cancels the disk check mode set as the beginning, and shifts to an original playback mode (S9, S10 →S15). In addition, since Db=Dm will be materialized if it is the optical disk 1 of normal, you may make it compare Dm with distinction data with this operation gestalt, although the procedure of S9 is comparing the distinction data of Db and ROM.

[0030] On the other hand, when the conditions of S9 are not fulfilled, and when [even if it fills it,] the conditions of S10 are not fulfilled Clear the storing data of RAM immediately and the procedure of S3-S10 is made to rerun (S9-S12 →S3), furthermore, even if it repeats the procedure 3 times and performs it, when the check conditions of S7 and S8 cannot be cleared While the microcomputer circuit 35 considers that an optical disk 1 is a completely inaccurate replica and outputs the display-control signal of playback disapproval, discharge actuation of the optical disk 1 is performed, and it escapes from this disk check mode (S12-S14). In addition, it is for expecting the prudence of the last decision to perform the procedure of S3-S10 3 times.

[0031] Compatibility can be made to provide simply if it is made to also make the optical disk with which according to this regenerative apparatus the executive program concerning the disk check mode of the microcomputer circuit 35 is switched with a DIP switch etc., and only the bar code symbol 5 is given correspond. moreover, although it be the arrangement mode in which the rill 6 formed in the bar code symbol 5 and tooth space element 5b of an optical disk 1 always appear on the same radius mostly with this operation gestalt, both may be make to be locate on another radius, and migration control of an optical pickup 21 will be perform so that the servo circuit 23 can scan each radius top in that case. Furthermore, not only a bar code symbol but a through tube is made into various character gestalten, and even if it is the method which forms the rill between them, a normality judgment of an optical disk can be made to make similarly, if based on the above basal principle. In addition, if this operation gestalt has the field which is an optical disk and is equivalent to the mirror plane field 4, it can be applied regardless of that class, and it can be applied to a variety of optical disks, such as not only CD but the mini disc and the MO disk of 2nd page lamination which are a typical optical disk, and DVD-ROM.

[0032]

[Effect of the Invention] The optical disk of this invention and its regenerative apparatus do the following effectiveness so by having the above configuration. By this invention, although it can reproduce comparatively easily only by giving that identification information by the bar code symbol to the mirror plane field of an optical disk like the conventional technique, although in addition to a bar code symbol it is made to give many rills of a book between that bar element and can realize using a comparatively cheap facility, since invention of claim 1 needs an advanced manufacturing technology, it makes unjust reproduction difficult and offers effective duplicate preventive measures. Moreover, existence of a high density bar code symbol can be made hard to discover, since it is camouflaged for a rill by the bar element. Invention of claim 2 makes disapproval playback of the optical disk which does not fulfill the conditions which the optical disk possesses as a regenerative apparatus for the optical disk of claim 1, and cancels unjust duplicates, such as a music title and game software. Moreover, since it is far low and the amounts of processed data on procedure activation are also fewer than the transfer rate of the main information on an optical disk, the transfer rate of the signal acquired based on a bar code symbol or a rill can share the hardware which the usual regenerative apparatus possesses about main circuits, such as quantity of light detection amplifier and a microcomputer circuit, and does not invite a so big cost rise to

the manufacturing cost of a regenerative apparatus. Furthermore, even if the optical disk which gave duplicate preventive measures only by the bar code symbol spreads, it also has the advantage of it being possible to make it correspond only by switching the program for judging reproductive authorization/disapproval with a DIP switch etc., and being able to make compatibility secure without being accompanied by the hardware change.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the top view (B) and the enlarged drawing of an important section by the side of the read side of the optical disk concerning the operation gestalt of this invention (A).

[Drawing 2] It is the sectional view seen in the hoop direction cross section passing through the abbreviation core of the width of face applied to radial [of a mirror plane field] in the part which gave the bar code symbol.

[Drawing 3] It is the system circuit diagram of the regenerative apparatus of an optical disk.

[Drawing 4] It is the graph which shows the output signal of the optical pickup in disk check mode.

[Drawing 5] It is the graph which shows the output signal of LPF.

[Drawing 6] It is the graph which shows the output signal of a comparator (signal system side concerning a bar code symbol).

[Drawing 7] It is the graph which shows the output signal of BPF.

[Drawing 8] It is the graph which shows the output signal of a detector circuit.

[Drawing 9] It is the graph which shows the output signal of a comparator (signal system side concerning a rill).

[Drawing 10] It is the graph which shows the spectrum of the signal concerning the frequency characteristics and bar code symbol, and rill of LPF and BPF.

[Drawing 11] It is the flow chart which shows the operations sequence in the disk check mode of a regenerative apparatus.

[Description of Notations]

1 [-- Mirror plane field,] -- An optical disk, 2 -- The record section of main information, 3 -- A clamper field, 4 5 -- A bar code symbol, 5a -- A bar element, 5b -- Tooth-space element, 6 [-- A reflecting layer, 21 / -- Optical pickup,] -- A rill, 10 -- A carbonate layer, 11 -- A protective layer, 12 22 -- A spindle motor, 23 -- A servo circuit, 24 -- Actuator driver, 25 [-- A comparator, 30 / -- BPF, 31 / -- A detector circuit, 33 / -- A switching circuit, 34 / -- A bar code decoder, 35 / -- Microcomputer circuit.] -- 26 Quantity of light detection amplifier, 29 -- Amplifier, 27 -- 28 LPF, 32

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